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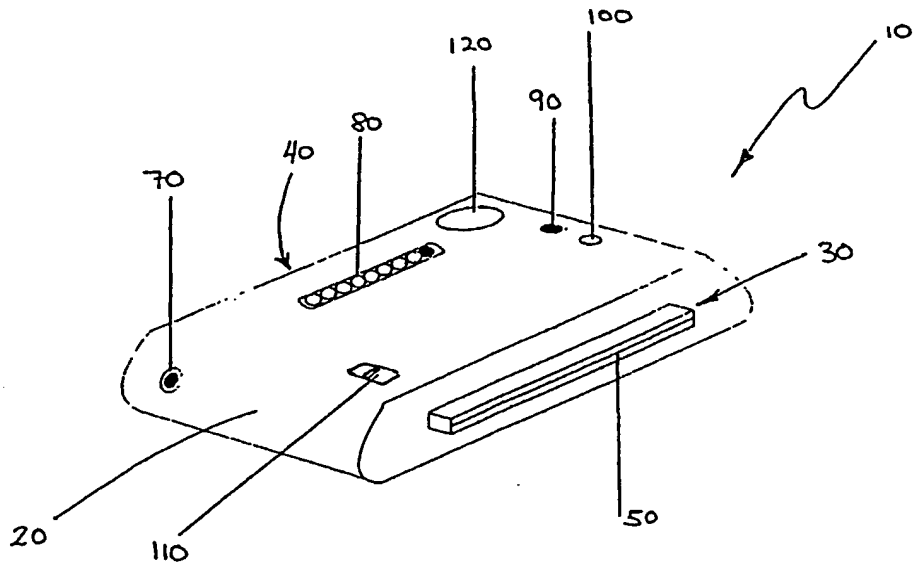
Published:
— *With international search report.*

For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

(54) Title: DATA TRANSMISSION APPARATUS



(57) Abstract: The present invention provides a wireless communications apparatus for wireless communications between a computing device and at least one mobile telecommunications network, the apparatus including a housing with at least one data port mounted in the housing for communicating with the computing device, wherein the at least one data port is suitable for connecting to the computing device without the interconnection of a cable, and the at least one data port includes a first data port which is directly connectable to a serial port of the computing device.

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Data Transmission Apparatus

TECHNICAL FIELD

The present invention concerns an apparatus for wireless communication between a computing device and a mobile communications network.

BACKGROUND OF THE INVENTION

With the rise in popularity of personal computers, there has been a growing need to transmit data between computers. When computers are located far from each other geographically, a telecommunications network is required for data transmission. Landline telecommunications networks have been convenient in the past for personal computers. However, as portable or "laptop" computers become popular, mobile telecommunications networks are increasingly being used to provide wireless data transmission. Conventional "mobile" or "cellular" telephones have been used for this purpose. In order to interface a laptop computer with a mobile telephone configured for analog operation, a data adaption device such as a modem is required to adapt data being sent or received. The modem outputs tones which are fed into the mobile telephone via a cable, and is typically in the form of a thin card placed in a slot in the computer. The configuration of the modem and computer is in accordance with the Personal Computer Memory Card International Association (PCMCIA) standard.

In order to interface a laptop computer with a conventional mobile telephone configured for digital operation, a digital output port of the computer is coupled to the mobile telephone via a cable. The digital

output port is typically configured in accordance with the RS-232 standard.

Throughout this specification, unless the context requires otherwise, the word "comprise" or variations such as "comprises" or "comprising", will be understood to imply the inclusion of a stated element or integer or group of elements or integers but not the exclusion of any other element or integer or group of elements or integers.

SUMMARY OF THE INVENTION

A first aspect of the present invention provides a wireless communications apparatus for wireless communications between a computing device and at least one mobile telecommunications network, the apparatus including a housing with at least one data port mounted in the housing for communicating with the computing device, wherein the at least one data port is suitable for connecting to the computing device without the interconnection of a cable, and the at least one data port includes a first data port which is directly connectable to a serial port of the computing device. The computing device may be any type of computing device and may be a desktop PC or laptop.

This approach is quite different to the current practice of using a cable to connect a conventional mobile telephone to a computing device. For example, the data port may comprise a plug or socket which connects directly to a respective socket or plug in a computer.

The data port of the communications apparatus may be configured to connect with a data adaptor, such as a PCMCIA card. Alternatively, the data port of the communications apparatus may be configured to connect directly to a serial data port of a computing device.

Preferably, the communications apparatus includes two separate data ports, a first data port being configured to connect directly to a data adaptor without the use of a cable, and a second data port configured to connect directly to a serial data port of a computing device without the use of a cable. The first and second data ports may be located on opposite sides of the housing.

The communications apparatus may include a modem inside the housing and interface directly with the computing device via a PCMCIA interface. Such an embodiment dispenses with the need to use a PCMCIA card as an interface between the apparatus and computing device. The apparatus may communicate with the mobile telecommunications network using an rf transmitter and receiver. The communications apparatus may be constructed without user interface facilities such as a keypad or display screen, thus allowing the weight and manufacturing costs to be minimised. The apparatus may be a dedicated device for communicating with a computing device and may optionally be constructed without a microphone or speaker. Other rudimentary user-interface facilities may also be provided, including a signal strength indicator, a power indicator, an "in-use" indicator, and an earphone socket. However, it will be understood that the apparatus may also include a microphone and speaker for detecting and transmitting, respectively, voice communications. The communications apparatus may optionally be powered from a power source provided in the computing device. Such an arrangement would further reduce the expense and weight of the communications apparatus. In another embodiment, the communications apparatus comprises a portable power source, such as one or more batteries. The batteries are preferably rechargeable. In another embodiment, the

communications apparatus comprises a connector, such as a power socket, for connecting to an external power source.

The communications apparatus may be arranged to transmit and/or receive data over either a digital network, an analog network, or both digital and analog networks.

A second aspect of the present invention provides a wireless communications apparatus dedicated for handling telecommunications to and/or from a computing device and at least one mobile telecommunications network, the apparatus including housing with at least one data port mounted in the housing for communicating with the computing device, the at least one data port including a data port which is directly connectable to a serial data port of the computing device.

This aspect of the invention therefore preferably provides a device which is dedicated for mobile network communications with a PC and therefore does not have any other function. There is no dedicated mobile network communications device currently available for communications with computing devices.

Preferably, the data port is suitable for directly connecting to the computing device (i.e without any intervening cable), as discussed above in relation to the first aspect of the present invention. This aspect of the present invention may have some or all of the features of the first aspect of the present invention.

A third aspect of the present invention provides a wireless communications apparatus for wireless communications between a computing device and at least one mobile telecommunications network, the apparatus not including an interface enabling the user to input

telephone numbers, whereby the telephone numbers for communication are input via the computing device.

This aspect of the invention may include any or all of the features of the aspects of the invention discussed above.

Embodiments of the invention will now be described by way of example with reference to the accompanying drawings.

BRIEF DESCRIPTION OF THE DRAWINGS

Fig. 1 is a pictorial view of an embodiment of a communications apparatus according to the invention.

Fig. 2 is a plan view of the communications apparatus shown in Fig. 1.

Fig. 3 is a block diagram of the major components of the communications apparatus shown in Figs. 1 and 2.

DETAILED DESCRIPTION OF THE DRAWINGS

An embodiment of a wireless communications apparatus will now be described with reference to Figs. 1 - 3. The communications apparatus 10 includes a housing 20 with two data ports 30, 40 on opposite sides of the housing. The first data port 30 includes a slot 50 for connecting to a PCMCIA card. The second data port 40 includes a connector 60 for plugging into a serial port of a computer.

The housing 20 also includes an earphone socket 70, a signal strength indicator 80, a power indicator 90, an "in-use" indicator 100, a switch 110 for switching between a digital transmission mode and an analog transmission mode, and an internal aerial 120.

The main components inside the communications apparatus 10 will now be described with reference to Figure 3. A SIM (subscriber identification module) reader

130 identifies the unique code of a telephone network subscriber before establishing a network connection between the communications apparatus 10 and mobile phone network. A power supply control logic block140 includes electronic circuitry to maintain a correct and stable power supply, and to ensure optimal usage of a battery which powers the apparatus 10. An interface circuit 150 provides the necessary interconnection or handshaking hardware between the communications apparatus 10 and a computer. A microprocessor and control unit 160 interprets and processes serial data which is input into, and output from, a computer serial data port. The microprocessor and control unit 160 carries out the processing task of a conventional modem. The microprocessor and control unit also includes a memory 170. An audio signal converter 180 provides analogue-to-digital signal conversion circuitry which enables the apparatus to operate as an audio communications tool. A digital signal processor 190 handles digital communications data flow which occurs between a computer and a telephone network via the communications apparatus. A radio frequency transmitter and receiver 200 operates as a two-way communications facility which transmits and receives digital data processed within the digital signal processor and the microprocessor control unit.

The communications apparatus may be used to provide wireless communications with many different types of computing devices, including PC's, laptop or notebook computers, palm-sized computers, or electronic diaries, or organisers.

It will be appreciated by a person skilled in the art that numerous variations and/or modifications may be made to the present invention as shown in the specific

embodiments without departing from the spirit or scope of the invention as broadly described. The present embodiments are therefore to be considered in all respects to be illustrative and not restrictive.

THE CLAIMS DEFINING THE INVENTION ARE AS FOLLOWS:

1. A wireless communications apparatus for wireless communications between a computing device and at least one mobile telecommunications network, the apparatus including a housing with at least one data port mounted in the housing for communicating with the computing device, wherein the at least one data port is suitable for connecting to the computing device without the interconnection of a cable, and the at least one data port includes a first data port which is directly connectable to a serial port of the computing device.

2. The apparatus of claim 1, wherein the at least one data port further comprises a second data port.

3. The apparatus of claim 2, wherein the second data port is directly connectable to the computing device via a PCMCIA interface.

4. A wireless communications apparatus dedicated for handling telecommunications to and/or from a computing device and at least one mobile telecommunications network, the apparatus including a housing with at least one data port mounted in the housing for communicating with the computing device, the at least one data port including a data port which is directly connectable to a serial data port of the computing device.

5. A wireless communications apparatus for wireless communications between a computing device and at least one mobile telecommunications network, the apparatus not including an interface enabling the user to input telephone numbers, whereby the telephone numbers for communication are input via the computing device.

6. A wireless communications apparatus substantially as hereinbefore described with reference to the accompanying drawings.

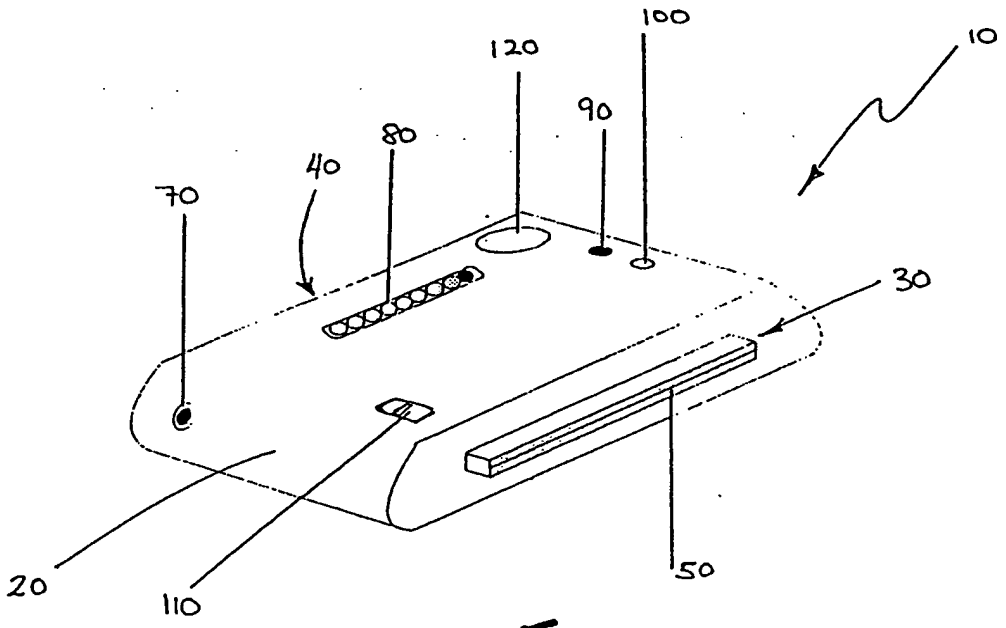
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Fig. 1

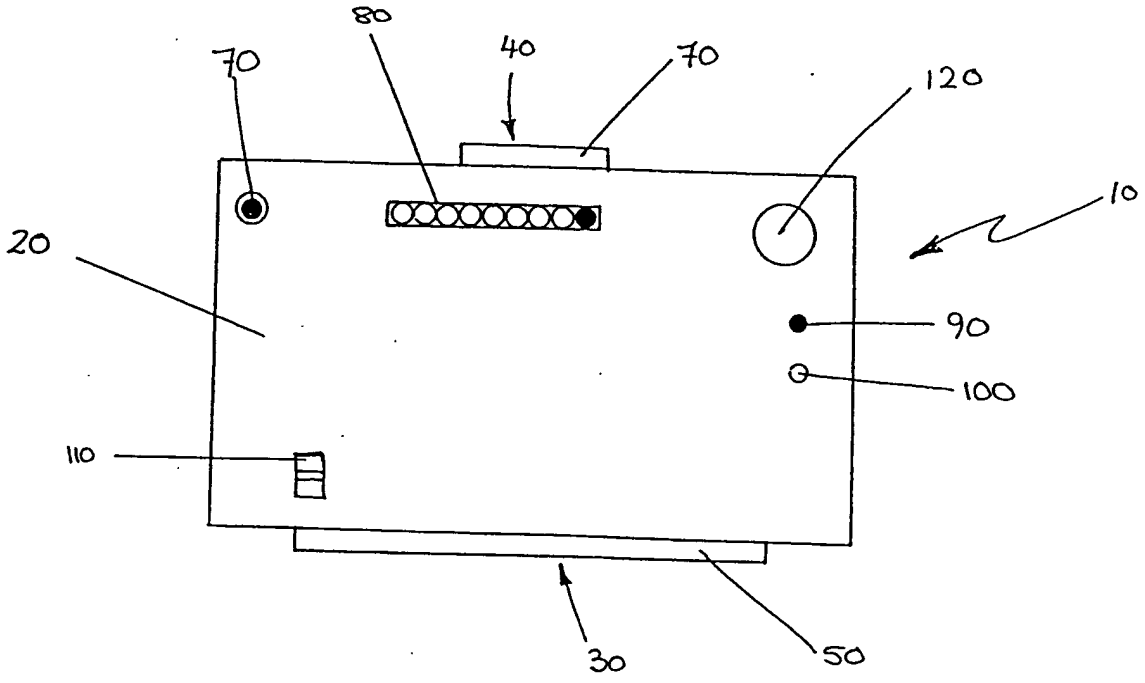
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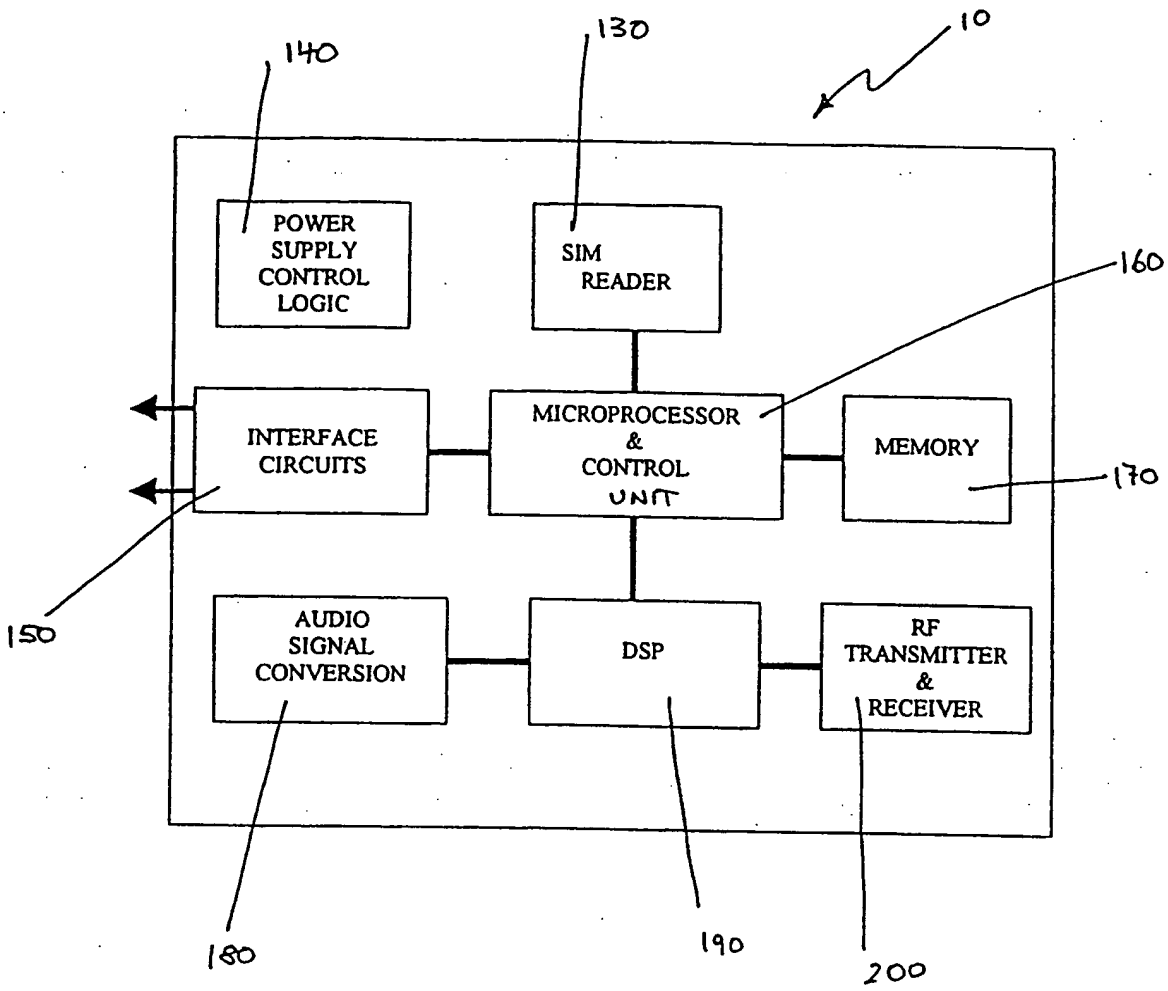
Fig. 2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POWER SUPPLY CONTROL LOGIC
SIM READER
INTERFACE CIRCUITS
MICROPROCESSOR & CONTROL UNIT
MEMORY
AUDIO SIGNAL CONVERSION
DSP
RF TRANSMITTER & RECEIVER

Fig.3

INTERNATIONAL SEARCH REPORT

International application No.
PCT/AU00/01578

Box I **Observations where certain claims were found unsearchable (Continuation of item 2 of first sheet)**

This international search report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. ☐ Claims Nos :

because they relate to subject matter not required to be searched by this Authority, namely:

2. ☐ Claims Nos :

because they relate to parts of the international application that do not comply with the prescribed requirements to such an extent that no meaningful international search can be carried out, specifically:

3. ☐ Claims Nos :

because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a)

Box II **Observations where unity of invention is lacking (Continuation of item 3 of first sheet)**

This International Searching Authority found multiple inventions in this international application, as follows:

Claims 1-4 being for a wireless communications apparatus with data port directly connectable to the serial port.

Claim 5 being for a wireless communications apparatus whereby telephone numbers are input via the computing device.

1. ☐ As all required additional search fees were timely paid by the applicant, this international search report covers all searchable claims
2. ☒ As all searchable claims could be searched without effort justifying an additional fee, this Authority did not invite payment of any additional fee.
3. ☐ As only some of the required additional search fees were timely paid by the applicant, this international search report covers only those claims for which fees were paid, specifically claims Nos.:

4. ☐ No required additional search fees were timely paid by the applicant. Consequently, this international search report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

Remark on Protest

☐ The additional search fees were accompanied by the applicant's protest.

☐ No protest accompanied the payment of additional search fees.

INTERNATIONAL SEARCH REPORT

International application No.
PCT/AU00/01578

A. CLASSIFICATION OF SUBJECT MATTER

Int. Cl. [7]: G06F 13/00

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)
WPAT KEYWORDS

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	GB2251357 A (MATSUSHITA ELEC IND CO LTD) 1 July 1992 See whole document	5
A	US, A, 5701515 (GRADELER) 23 December 1997 See whole document	

☐ Further documents are listed in the continuation of Box C ☒ See patent family annex

* Special categories of cited documents:

"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier application or patent but published on or after the international filing date

"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art

"&" document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
9 February 2001	1 March 2001
Name and mailing address of the ISA/AU AUSTRALIAN PATENT OFFICE PO BOX 200, WODEN ACT 2606, AUSTRALIA E-mail address: pct@ipaustralia.gov.au Facsimile No. (02) 6285 3929	Authorized officer Stephen Lee Telephone No : (02) 6283 2205

Form PCT/ISA/210 (second sheet) (July 1998)

INTERNATIONAL SEARCH REPORT
Information on patent family members

International application No.
PCT/AU00/01578

This Annex lists the known "A" publication level patent family members relating to the patent documents cited in the above-mentioned international search report. The Australian Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

Patent Document Cited in Search Report		Patent Family Member	
GB	2251357	JP	4150444
US	5701515	NONE	

END OF ANNEX